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CHARGER ADAPTER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a charger adapter, and more particularly a charger adapter which can be used with an indoor receptacle for electric supply or a vehicle cigarette lighter.

2. Description of Related Art

Chargeable batteries for mobile phones are generally charged by charger adapters specially designed for the batteries. The conventional charger adapter is composed of a charger and an adapter detachably mounted together. In use, the battery is positioned in the charger, and the adapter is electrically connected with an indoor main socket for electrical supply.

However, in an outdoor situation, such as a vehicle, the charger adapter can not be used, and the mobile phone must be directly connected with a vehicle cigarette lighter to charge batteries in the mobile phone.

Furthermore, the conventional charger adapter is generally applied for the plate-like battery and can not charge a cylindrical battery.

Therefore, the invention provides a charger adapter to mitigate or obviate the aforementioned problems.

SUMMARY OF THE INVENTION

The main objective of the present invention is to provide a charger adapter which can be conveniently used with an indoor mains socket for electrical supply or a vehicle cigarette lighter socket.

Other objectives, advantages and novel features of the invention will

1 become more apparent from the following detailed description when taken in
2 conjunction with the accompanying drawings.

3 **BRIEF DESCRIPTION OF THE DRAWINGS**

4 Fig. 1 is a perspective view of a charger adapter in accordance with the
5 present invention;

6 Fig. 2 is an exploded perspective view of the charger adapter in Fig. 1;

7 Fig. 3 is a bottom perspective view of the charger in Fig. 1;

8 Fig. 4 is an exploded perspective view of an adapter in Fig. 1 assembled
9 with another embodiment of a charger in accordance with the invention;

10 Fig. 5 is a perspective view of the charger in Fig. 1 assembled with a
11 further embodiment of an adapter in accordance with the invention;

12 Fig. 6 is a perspective view of the adapter in Fig. 5; and

13 Fig. 7 is a perspective view of the adapter in Fig. 5 assembled with the
14 charger in Fig. 4.

15 **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

16 With reference to Figs. 1-2, a charger adapter in accordance with the
17 present invention is composed of an adapter (10), and a charger (20) detachably
18 mounted on the adapter (10).

19 The adapter (10) has a foldable plug (11) provided at a bottom surface
20 thereof and matching an indoor receptacle for mains electrical supply. The plug
21 (11) can be made with various sizes and shapes according to specifications of
22 various countries. The plug (11) has a structure similar to the prior arts, which
23 will not be described in detail. A tongue (13) is formed at an upper surface of the
24 adapter (10). Two channels (131) are respectively defined at two sides of the

1 tongue (13). Two first elongated holes (141) are defined through the tongue (13),
2 and two teeth (14) respectively and elastically protruded from the first elongated
3 holes (141). A DC terminal (12) is formed at a side surface between the bottom
4 and upper surfaces of the adapter (10). An electric appliance (not shown), such
5 as a digital camera or mobile phone, can be directly connected with the adapter
6 (10) by a special wire for charging batteries in the electric appliance.

7 The adapter (10) has a circuit board (not shown) provided therein and
8 respectively electrically connected with the plug (11), DC terminal (12) and teeth
9 (141). Thus, AC current is transformed into DC current output from the DC
10 receptacle (12) and teeth (14).

11 With reference to Fig. 3, the charger (20) has a notch (21) defined at a
12 bottom surface thereof for receiving the tongue (13) to position the charge (20)
13 on the adapter (10). Two bars (211) are respectively formed at two opposed sides
14 of the notch (21) and received in the channels (131) when the tongue (13) is
15 inserted in the notch (21). (Alternatively, the tongue (13) is made with a V-like
16 cross section, and the notch (21) is defined with a V-like cross section matching
17 the tongue (13)). An entrance (212) with a width larger than a distance between
18 the bars (211) is defined at an open end of the notch (21) to facilitate the tongue
19 (13) inserting into the notch (21). Two second elongated holes (22) are defined in
20 the notch (21) and respectively correspond to the first elongated holes (141) of
21 the tongue (13). Two contacts (23) are respectively provided in the second
22 elongate holes (22). When the tongue (13) is inserted in the notch (21), the teeth
23 (14) are respectively positioned in the second elongated holes (22) and
24 electrically connected with the contacts (23). A chamber (24) is defined at an

1 upper surface of the charger (20) for receiving a plate-type battery (30) used for
2 mobile phones. An opening (241) is defined at a side of the chamber (24) to
3 facilitate taking out the plate-type battery (30).

4 With reference to Fig. 4, in another embodiment, a second charger (20A)
5 has a second chamber (24A) for receiving cylindrical batteries (31). A second
6 opening (241A) is defined at a side of the chamber (24) to facilitate taking out
7 the cylindrical batteries (31).

8 In use, the charger (20) (or the second charger (20A)) is mounted on the
9 adapter (10) by inserting the tongue (13) into the notch (21) through the entrance
10 (212). The bars (211) are respectively engaged in the channels (131), and the
11 teeth (14) are respectively positioned in the second elongated holes (22) to
12 electrically connect the adapter (10) with the charger (20). After charging, by
13 pulling backwards the tongue (13) out from the notch (21), the adapter (10) can
14 be easily detached from the charger (20). Thus, it is very convenient for a user to
15 assemble/disassemble the charger (20) with/from the adapter (10).

16 With reference to Figs. 5-7, in a further embodiment, the charge adapter
17 has a second adapter (40) with a connector (421) matching a cigarette lighter
18 receptacle (not shown) in an automobile and connected by a wire (42) with the
19 second adapter (40). The adapter (40) has a second tongue (43) formed at an
20 upper surface thereof, and two second channels (41) are respectively defined at
21 two sides of the second tongue (43). Two third elongated holes (441) are defined
22 through the second tongue (43), and two second teeth (44) are respectively and
23 elastically protruded from the third elongated holes (441).

24 As illustrated in Figs. 5 and 7, the charger (20) (or the second charger

1 (20A)) can be electrically connected with the second adapter (40) by inserting
2 the second plug (43) into the notch (21). Then, the connector (421) is inserted in
3 the cigarette lighter receptacle for charging the plate-like battery (30) (or the
4 cylindrical batteries (31)).

5 It is to be understood, however, that even though numerous
6 characteristics and advantages of the present invention have been set forth in the
7 foregoing description, together with details of the structure and function of the
8 invention, the disclosure is illustrative only, and changes may be made in detail,
9 especially in matters of shape, size, and arrangement of parts within the
10 principles of the invention to the full extent indicated by the broad general
11 meaning of the terms in which the appended claims are expressed.